CLAIMS

WE CLAIM:

1.   A liquid crystal (LC) optical performance monitor (OPM), comprising:

a C-polarizer having a birefringent crystal having a first face and a second face for receiving a collimated beam and separating the collimated beam into a P-polarization beam and a S-polarization beam;

a waveplate coupled to the second face of the crystal for rotating the S-polarization beam by 90 degrees, thereby causing the rotated S-polarization beam to have the same polarization as the P-polarization beam; and

a liquid crystal tunable filter for receiving and processing the P-polarization beam and the rotated S-polarization beam from the C-polarizer.

2.   The LC OPM of Claim 1, further comprising a small beam collimator coupled to the first face of the C-polarizer, the small beam collimator receiving an input beam and collimating the input beam to become the collimated beam.

3.   The LC OPM of Claim 1, further comprising a beam collimator coupled to the first face of the C-polarizer, the beam collimator providing a minimal space separation between the P-polarization beam and the rotated S-polarization beam.

4.   The LC OPM of Claim 2, wherein C-polarizer and the small beam collimator are rotated to match a polarization orientation of the LC material inside a LC cavity of the LC tunable filter.

1   5.   The LC OPM of Claim 4, further comprising a photodiode for receiving

2   the P-polarization beam and rotated S-polarization beam.

1   6.   The LC OPM of Claim 1, further comprising a bi-cell photodiode having a

2   first cell and a second cell, the first cell of the bi-cell photodiode receiving the P-

3   polarization beam, the second cell of the bi-cell photodiode receiving the rotated S-

4   polarization beam.

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1   7.   A method of a LC OPM, comprising:

2   separating a collimated beam into a P-polarization beam and a S-polarization

3   beam;

4   rotating the S-polarization beam by 90 degrees, thereby the S-polarization beam

5   having the same polarization as the P-polarization beam; and

6   scanning to filter the spectral information of the S-polarization beam and the P-

7   polarization beam by a liquid crystal tunable filter.

1   8.   The method of Claim 8, further comprising collimating an input beam to

2   generate the collimated beam.

1   9.   The method of Claim 10, further comprising matching the alignment of the

2   LC filter in the direction of the liquid crystal.

1   10.   The method of Claim 10, further comprising applying a voltage to an LC

2   tunable filter to affect the rotated S-polarization beam and the P-polarization beam.

1   11.   A method of a LC OPM, comprising:

2   separating a collimated beam into a first beam comprising a first linear

3   polarization and a second beam comprising a second linear polarization that is orthogonal

4   to the first linear polarization;

5   rotating the polarization of one of the first beam or the second beam by 90

6   degrees, thereby causing the first and second beams to have the same polarization; and

7   scanning to filter the spectral information of the first beam and the second beam

8   by a liquid crystal tunable filter.

1   12.   The method of Claim 11, further comprising collimating an input beam to

2   generate the collimated beam.

1   13.   The method of Claim 12, further comprising matching the alignment of the

2   LC filter in the direction of the liquid crystal.

1   14.   The method of Claim 13, further comprising applying a voltage to an LC

2   tunable filter to affect the rotated first beam and the second beam.

LC OPM   AVA-P007